

REMARKS

Claims 1 – 13 are pending in the present application. With this Response, Applicant cancels claim 13 without prejudice or disclaimer, and amends claims 1, 4 – 8 and 12. No new matter is introduced.

OBJECTION TO DRAWING

The drawing is objected to under 37 C.F.R. § 1.84(p)(4) because reference characters 1 – 3 are respectively used in FIG. 1 to indicate a mobile station, base station and base station control apparatus, and then used in the specification beginning at page 1, line 32 to indicate wireless channels. Applicant proposes an associated revision to FIG. 1 to address this objection by identifying wireless channels m1, m2 and m3, as indicated in the attached drawing replacement pages, provided in both marked-up and clean copies, and also amends the specification to reflect these changes to revised FIG. 1. Applicant respectfully requests that the proposed revision be accepted, and that the objection be withdrawn.

OBJECTION TO SPECIFICATION

The specification is objected to with regard to a number of informalities at page 2, lines 28 and 30, page 7, lines 8 and 28, page 20, line 17 and page 22, line 12. Applicant thanks the Examiner for suggesting amendments to address the informalities, amends the specification accordingly, and respectfully requests that the objection be withdrawn.

REJECTION UNDER 35 U.S.C. § 112

Claims 4 – 6 and 8 – 11 are rejected under the first paragraph of 35 U.S.C. § 112 as failing to be enabled. In claims 4 and 8, the Examiner finds that the limitation “integrating said bearer service data into a wireless channel” does not disclose with what the bearer service data is integrated, and suggests the amendment “integrating said bearer service data into a wireless channel with another bearer service data”. In claim 6, the Examiner finds that the claimed delays are not defined with reference to the individual bearer services (A, B, C). Applicant amends each of claim 4 and 8 to recite that a bearer service or bearer service data is integrated with another bearer service or bearer service data. In addition, Applicant amends claim 6 to identify a bearer service in association with each recited bearer frame that is delayed. Accordingly, Applicant respectfully requests that the rejection under the first paragraph of 35 U.S.C. § 112 of claims 4 – 6 and 8 – 11 be withdrawn.

Claims 5, 6 and 8 – 11 are rejected under the second paragraph of 35 U.S.C. § 112 as being indefinite. Specifically, the Examiner cites the term “such as” of claims 5 and 8, and the term “the maximum allowable delay” of claim 8. Applicant amends claims 5 and 8 to eliminate the term “such as”, amends claim 8 to recite “a maximum allowable delay, and respectfully requests that the rejection be withdrawn.

Applicant thanks the Examiner for indicating that claims 8 – 11 would be allowable if amended to overcome the rejections under 35 U.S.C. § 112. Based on the above-discussed amendments made to claim 8, Applicant respectfully submits that claims 8 – 11 are in condition for allowance.

REJECTION UNDER 35 U.S.C. § 103

Claims 1 - 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant’s admitted prior art (AAPA) in view of U.S. Patent No. 5,430,774 to Dupuy. Claims 12 and 13 are

rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of U.S. Patent No. 5,559,796 to Edem et al. Applicant cancels claim 13 without prejudice or disclaimer, amends claims 1 and 4 – 7 to clarify the nature of his invention, and respectfully traverses these rejections.

In independent claims 1, Applicant discloses

1. A bearer integration method for integrating a plurality of bearer services into a wireless channel by performing time-division multiplexing/demultiplexing, said bearer integration method comprising the steps of:

inputting each bearer frame of a bearer service in synchronization with reference frame timing of a period T in a sending side;

delaying each bearer frame of said bearer service by one frame period by allocating delays A ($0 \leq A \leq T$) and A' ($= T - A$) between the sending side and a receiving side;

outputting each bearer frame of said bearer service in the receiving side; and

integrating said bearer service data into a wireless channel with another bearer service in which delays B ($A \leq B \leq T$) and B' ($= T - B$) are allocated between the sending side and the receiving side.

The Examiner suggests that the limitations of claim 1 are largely read on by AAPA, but acknowledges that AAPA does not disclose Applicant's claimed step of delaying bearer service data by one or more frame periods by allocating delays between a sending side and a receiving side, and applies Dupuy for this purpose.

Dupuy discloses a method to for transmitting data from a base transceiver to a transcoder (see, e.g., abstract of Dupuy). According to the method of Dupuy, the transceiver inserts transmission delays to eliminate transmission gaps arising from varied transmission sequences (see, e.g., FIG. 2 and column 3, line 34 – column 4, line 14 of Dupuy).

In sharp contrast to the method disclosed by Dupuy, in independent claim 1, Applicant discloses a bearer integration method in which each frame of a bearer service is delayed by a

frame period T by allocating a sending delay A ($0 \leq A \leq T$) on the transmission side and a receiving delay A' ($= T - A$) on the receiving side. Applicant's claimed method permits different bearer services that are normally transmitted in different wireless channels requiring different sending delays to be easily aligned on the receiving side, so when two services are integrated for transmission in a single channel transmission gaps can be avoided.

Unlike the method of Dupuy, Applicant's claimed method does not provide an alignment on the transmitting side. Rather, in accordance with Applicant's claimed method, a delay is introduced to a frame transmitted on the transmitting side in order to maintain a difference in offsets among wireless channels (as required, for example, by a CDMA protocol). Applicant's claimed method compensates for these offsets by adding an additional delay on the receiving side, such that the sum of delays on the transmitting and receiving sides for a transmitted frame is equal to a full frame period. In this manner, frames may continue to be transmitted with the necessary channel offsets, and aligned by introducing additional delays on the receiving side. Significantly, unlike Applicant's invention as claimed in claim 1, neither AAPA nor Dupuy, alone or in combination, disclose or otherwise suggest Applicant's claimed step of "allocating delays A ($0 \leq A \leq T$) and A' ($= T - A$) between the sending side and a receiving side". Clearly, unlike Applicant's claimed invention, neither AAPA nor Dupuy contemplate inserting associated delays on each of the transmitting and receiving sides in order to achieve a predetermined delay interval.

Accordingly, Applicant respectfully submits that independent claim 1 is not made obvious by the combination of AAPA and Dupuy, and is therefore allowable. The limitations of independent claim 4 are similar to the limitations discussed above in relation to claim 1, with the difference that the sum of delays on the transmitting and receiving sides for a transmitted frame

is equal to two full frame periods. Accordingly, Applicant substantially reapplies the arguments submitted above in reference to independent claim 1 to assert that independent claim 4 is also allowable.

In independent claim 12, Applicant discloses:

12. A communication system which integrates a plurality of bearer services into a wireless channel by performing time-division multiplexing/demultiplexing, said communication system comprising:

a send delay adding part which synchronizes with reference frame timing, delays each bearer frame of one or more bearer services input before bearer integration timing up to each frame offset timing, and delays each bearer frame of the one or more bearer services input after bearer integration timing up to frame offset timing for bearer integration; and

a bearer data multiplexing part which time-division multiplexes bearer frames of the one or more bearer service output from said send delay adding part, wherein the bearer frames that are multiplexed are transmitted via a wireless channel;

a bearer data separation part which time-division multiplexes the bearer frame of the one or more bearer services that are multiplexed received via the wireless channel; and

a receive delay adding part which delays each bearer frame of the one or more bearer services input before bearer integration timing up to reference frame timing, and delays each bearer frame of the one or more bearer services output from said bearer data separation part after bearer integration timing up to reference frame timing.

The Examiner acknowledges that AAPA does not disclose Applicant's claimed send delay adding part and receive delay adding part, but suggests that these features are taught by Edem. Edem discloses a system for controlling delays in a network, in which a receiving end employ a variable delay FIFO to eliminate variability introduced in a transmitting end (see, e.g., abstract of Edem). Unlike Applicant's invention, however, Edem fails to disclose or suggest a send delay adding part that delays each bearer frame up to a frame offset timing and a receive delay adding part on a receiving side that delays each bearer frame up to reference frame timing so that a delay of one reference frame is applied to each frame, allocated between the send and

receiving sides. Accordingly, Applicant respectfully submits that independent claim 12 is not made obvious by the combination of AAPA and Edem, and is therefore allowable.

In summary, Applicant submits that independent claims 1, 4 and 12 are not made obvious by the cited references, and are therefore in condition for allowance. As dependent claims 2, 3 and 5 – 7 each depend from one of allowable claims 1 and 4, Applicants further submit that claims 2, 3 and 5 – 7 are allowable for at least this reason.

CONCLUSION

In view of the amendments and set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,



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Docket No.: FUJI 17.563 (100794-11475)
TJB: pm

(REPLACEMENT SHEET)



FIG.1 PRIOR ART

